

# **MAYOR AND COUNCIL COMMUNICATION**

**CITY COUNCIL MEETING: FEBRUARY 18, 2019 - WORKSHOP**

**SUBJECT:** PRESENTATION AND DISCUSSION OF ENPROTEC / HIBBS & TODD, INC (eHT) REVIEW OF THE GUADALUPE-BLANCO RIVER AUTHORITY (GBRA) WATER TREATMENT PLANT PROPOSAL

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**INFORMATION:**

**AGENDA ITEM  
NUMBER 1**



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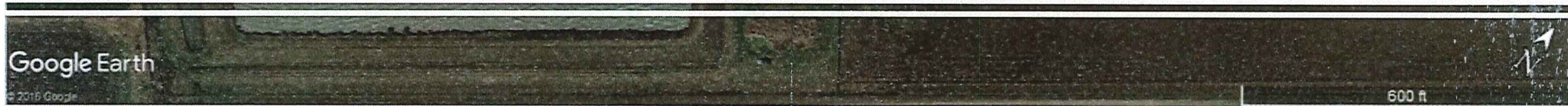


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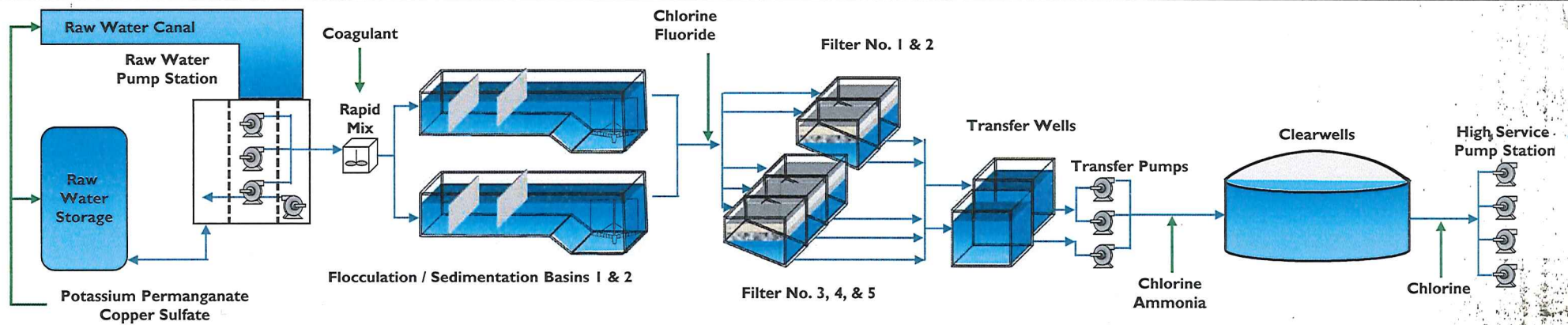


Port Lavaca WTP - Aerial View





# Port Lavaca WTP Aerial View



# GBRA Water Treatment Plant in Port Lavaca

➤ Capacity 6.8 MGD

➤ Service Areas

- City of Port Lavaca
- Calhoun County Rural Water District
- Port O'Conner Improvement District

➤ Service Population: 24,000



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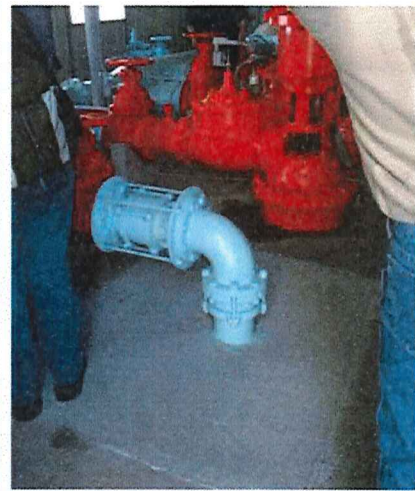


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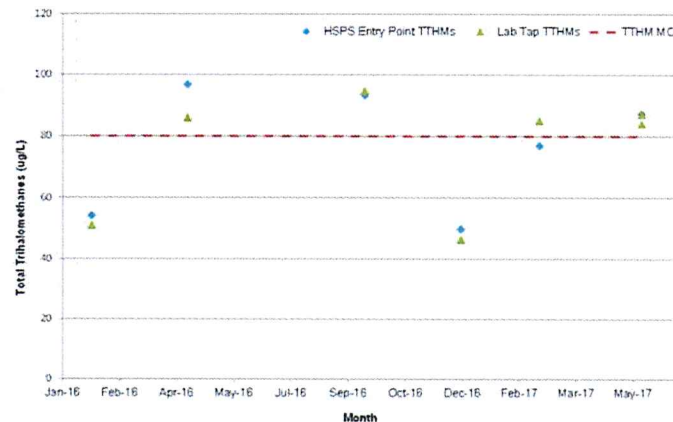


# Examples of Evaluation Results

- Architectural & Structural
- Electrical & Instrumentation
- Regulatory & Operational
- Hydraulic & Mechanical



Finished Water TTHM



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# Summary of Results

## Plant Evaluation

### Major Challenges

DBPs

Filtered Water Turbidity

Equipment Condition

Existing Building Condition

Environmental Effects

Shallow Groundwater

### Other Concerns

Larger TSR preferred for outages.

Adjacent fish lagoons and aerators.

Canal plant growth & effects of agricultural products – spraying, tannic events.

GBRA has to provide pressure for Port Lavaca (PL).

Age and condition of PL supply pipeline.

Accessibility of public to the WTP for bill paying (need separation).

Use of current site for land application of sludge.

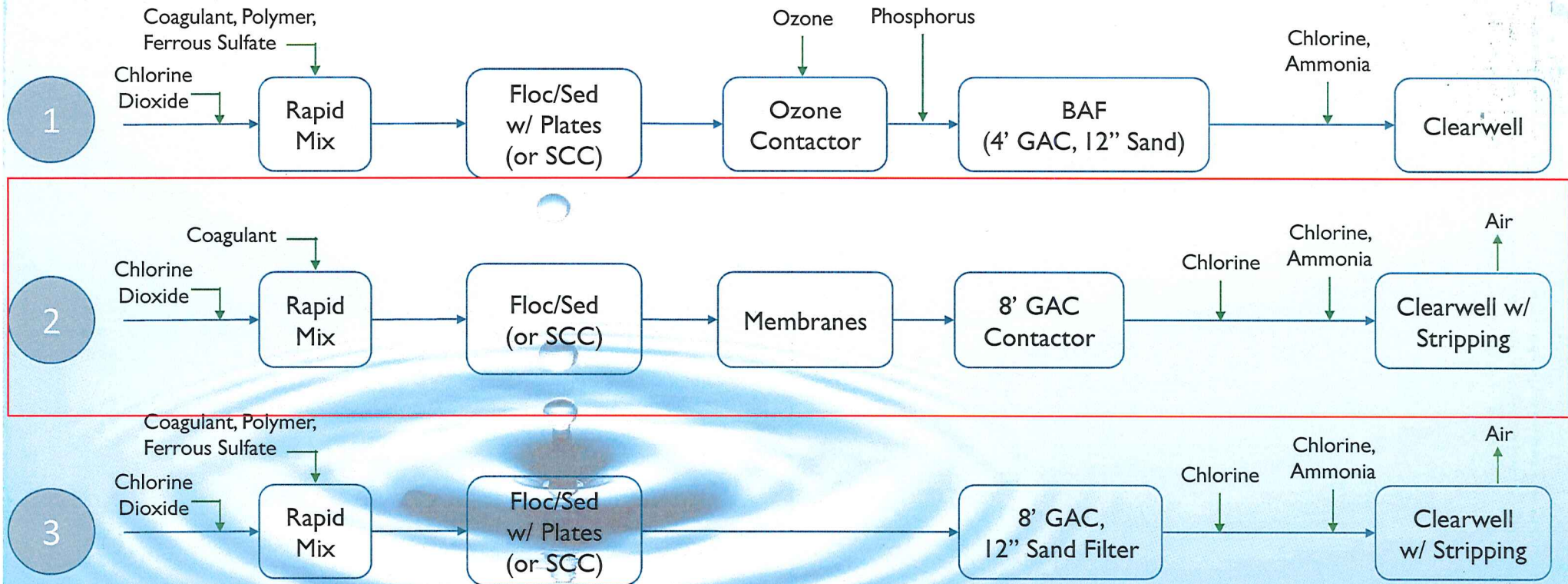


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# Selected Alternative Treatment Schemes



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# Question 1

➤ What benefits are gained by moving the WTP to a new location compared to the existing location?

- Decreased risk of inundation from hurricane storm surge
- Potential for decreased risk of infrastructure damage due to hurricane-force winds
- Potential for improved raw water quality (i.e. decreased TOC content)
- Decreased risk of groundwater intrusion due to deeper groundwater and absence of fish hatchery
- Ability to more easily modify terminal storage reservoir capacity and elevation
- All new infrastructure – increased reliability, increased operational efficiency
- Relatively more ideal soil conditions for construction
- Access during or immediately after a storm is improved
- Not relying on the existing transmission line for supply
- Less complicated sequence of construction and shorter construction time



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## Question 3

- If the existing WTP is retrofitted, how long is it out of service after a category 5 storm?
  - **Answer:** The WTP can stay online during a storm, or can be back online briefly after a shutdown, provided the following assumptions:
    - Hurricane storm surge assumptions:
      - Inundation = 9 feet above mean sea level or less with no wave action
      - Terminal storage reservoir not inundated or contaminated by saltwater from wave action
      - No floating debris has damaged equipment or infrastructure
    - WTP operation assumptions:
      - An operator stays at the WTP during the storm or WTP is accessible soon after storm
      - Chemical supplies are sufficient until the next delivery can be made
      - Fuel supply for the generator is sufficient until additional fuel can be purchased or electricity is restored





# Recommendation and Costs

Guadalupe-Blanco River Authority Port Lavaca WTP Preliminary Opinion of Probable Construction Cost - Site 11, Onsite TSR, Elevated Storage			
1.0	Raw Water Pump Station	\$	1,121,000
2.0	Terminal Storage Reservoir	\$	2,500,000
3.0	Chemical Supply	\$	2,841,000
4.0	Rapid Mix	\$	113,000
5.0	Flocculation/Sedimentation Basins	\$	1,198,000
6.0	8' GAC Filter	\$	4,252,000
7.0	GAC Media for Filter Testing	\$	60,000
8.0	Filter to Clearwell Transfer Pump Station	\$	1,121,000
9.0	Clearwell & Ground Storage		
	Port Lavaca Ground Storage Tank - (0.5 MG)	\$	785,000
	Clearwell (1 MG) with Baffles at New Site	\$	1,031,000
10.0	Elevated Storage Tank	\$	1,541,000
11.0	High Service Pump Stations		
	Transfer Pump Station from New Site to Elevated Storage Tank	\$	2,536,000
	High Service Pump Station in Port Lavaca (GST to Port Lavaca Storage)	\$	1,416,000
	High Service Pump Station (Existing WTP to Port O' Connor Storage)	\$	600,000
12.0	Other Buildings	\$	2,347,000
13.0	Solids Handling	\$	478,000
14.0	Existing Site Demolition	\$	504,000
15.0	Emergency Generator	\$	1,255,000
16.0	Yard Piping, Roads, and Site Development	\$	2,703,000
17.0	PLC and SCADA Integration	10%	\$ 2,548,000
18.0	Site Electrical & Instrumentation	10%	\$ 2,753,000
<b>Project Subtotal</b>		<b>\$</b>	<b>33,703,000</b>
19.0	Contractor Mobilization/Demobilization	3%	\$ 910,000
20.0	Contractor Overhead, Insurance, Bonds, Profit	20%	\$ 6,238,000
21.0	Contingencies	30%	\$ 11,229,000
<b>PROJECT CONSTRUCTION TOTAL</b>		<b>\$</b>	<b>52,080,000</b>

Guadalupe-Blanco River Authority Port Lavaca WTP Preliminary Opinion of Probable Construction Cost - Existing Plant Site, City Storage			
1.0	Raw Water Pump Station	\$	1,121,000
2.0	Terminal Storage Reservoir	\$	3,073,000
3.0	Chemical Supply	\$	2,841,000
4.0	Rapid Mix	\$	113,000
5.0	Flocculation/Sedimentation Basins	\$	1,198,000
6.0	8' GAC Filter (4' GAC Media)	\$	4,252,000
7.0	GAC Media for Filter Testing	\$	60,000
8.0	Filter to Clearwell Transfer Pump Station	\$	1,121,000
9.0	Clearwell & Ground Storage		
	Clearwell (1 MG) with Baffles	\$	1,031,000
10.0	Elevated Storage Tank	\$	-
11.0	High Service Pump Stations		
	Transfer Pump Station from Existing WTP to EST's in Port Lavaca	\$	2,536,000
	High Service Pump Station (Existing WTP to Port O' Connor Storage)	\$	600,000
12.0	Other Buildings	\$	2,501,000
13.0	Solids Handling	\$	327,000
14.0	Existing Site Demolition	\$	935,000
15.0	Emergency Generator	\$	1,088,000
16.0	Yard Piping, Roads, and Site Development	\$	2,182,000
17.0	PLC and SCADA Integration	10%	\$ 2,148,000
18.0	Site Electrical & Instrumentation	10%	\$ 2,312,000
<b>Project Subtotal</b>		<b>\$</b>	<b>29,439,000</b>
19.0	Contractor Mobilization/Demobilization	3%	\$ 763,000
20.0	Contractor Overhead, Insurance, Bonds, Profit	20%	\$ 5,540,000
21.0	Contingencies	30%	\$ 9,522,000
<b>PROJECT CONSTRUCTION TOTAL</b>		<b>\$</b>	<b>45,264,000</b>



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Cost Reduction Measure	Consequence	Savings (at Ex. Site - OPCC)
No Storm Surge Protection Berm or TSR Capacity Increase	Increased vulnerability from Category 3 Storm and Unacceptable Raw Water Quality	> \$5 Million
Demolish Existing Admin Building Instead of Refurbishing	Loss of asset – Building does not meet code and is not “hardened”	> \$250 Thousand
No New Bill Paying Facility on Site	Splitting up of staff – Customer feedback	> \$150 Thousand
No Demolition of Existing Site Facilities (Excluding Admin)	Vector attraction, continued deterioration could result in dangerous on-site conditions	> \$50 Thousand
Rehab Raw Water Pump Station	Construction sequence challenges. Less reliable than new piping, valves, etc.	> \$500 Thousand
Decrease Level of Treatment for DBPs	Increased risk of DBP violations without testing	\$0.5 - \$5 Million
Utilize Ex. Floc/Sed Structure for Chemical Storage, Electrical Bldg, Maintenance Bldg, Ozone Treatment, etc.	More complicated construction and implementation	> \$2 Million
Port Lavaca Construct New HSPS in Town; Construct Low Head PS at WTP	Reduces risk of pipeline failure. Eliminates GBRA pressurizing PL	\$50 - \$100 Thousand



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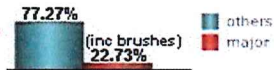


### Names from list above

Ella, Debra, Carla, Abby, Candy, Celia, Fern, Bill, Delia, Alicia, Charley, Frances, Fay, Claudette, Erin, Bill, Harvey,

### Tropical Storm to Hurricane ratio

TS=20, 45.45% H=24, 54.55%



### Longest gap between storms

14 years 1984-1997

### How often this area gets affected?

brushed or hit every 3.32 years

Source: hurricanecity.com for Port O'Connor

### Average years between direct hurricane hits.(hurricane force wind gusts for a few hours)

(11h) once every 13.27 years [state stats](#)

### Average years between major hurricane hits.(4)

once every 36.50 years

### Average MPH of hurricane hits. (based on advisories sustained winds, not gusts)

105mph ← Category 2 storm

### Statistically when this area should be affected next

Before the end of 2021

### Last affected by

2017 August 25th/26th Hurricane Harvey brushes just south of city by 35 miles with 130mph winds while moving N.W. area has gust's to 80mph ,3.25ft storm surge.

### This areas hurricane past

1875 sept 16 90 mph causes very heavy storm surge flooding from the ESE .Three-fourths of the town was swept away...176 lives were lost. The highest wind



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## Potential Cost Savings Measures - Structures

Only “hurricane harden” a small portion of the overall WTP capacity

What would happen in a Cat 5 storm? Is it reasonable to assume that much of the city would be out of commission?

Why not reduce scope and provide provisions for other means of supplying water?

When is mandatory evacuation; Cat. 3 storm?



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## Potential Cost Savings Measures - Treatment

Remove GAC and/or air stripping; run simply chloramines post primary disinfection

Seasonal free chlorine as needed to achieve CT

Average TTHM is 50-80 ppb currently



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